Claims

1. (currently amended) A computer-readable medium encoded with computer-executable instructions for causing a computer programmed thereby to perform a method of controlling quality of information in a constant bitrate encoder, wherein the encoder outputs the information at variable quality and compressed to a constant or relatively constant bitrate, the method comprising:

quantizing a block of information to meet constant or relatively constant bitrate requirements, wherein the encoder adjusts quantization step size of the quantizing in view of a comparison of a target quality parameter for the block to a quality measurement for the block as quantized and reconstructed, thereby reducing number of changes in quality and smoothing transitions between the changes in quality; and

entropy coding the quantized block of information.

2. (original) The computer-readable medium of claim 1 wherein the encoder adjusts the quantization step size also in view of a target minimum-bits parameter and a target maximum-bits parameter.

3. (original) The computer-readable medium of claim 1 wherein the encoder adjusts the quantization step size also in view of one or more complexity estimates and one or more complexity estimate noise measures.

4. (original) The computer-readable medium of claim 1 wherein the block has a block size selected from among plural available block sizes, wherein the encoder adjusts the quantization step size also in view of a value of control parameter for the block, and wherein the encoder normalizes block size when computing the value.

5. (original) The computer-readable medium of claim 1 wherein the encoder adjusts the quantization step size in a quality control quantization loop and in a bit-count control quantization loop following and de-linked from the quality control quantization loop.

6. (original) The computer-readable medium of claim 5 wherein the encoder adjusts the quantization step size by different rules in the quality control quantization loop and the bit-count control quantization loop.

7. (original) The computer-readable medium of claim 1 wherein the encoder accounts for non-monotonicity of quality as a function of quantization step size when the encoder adjusts the quantization step size.

8. (original) The computer-readable medium of claim 1 wherein the encoder adjusts the quantization step size also in view of a value of control parameter for the block, and wherein the encoder lowpass filters the value as part of a series of values.

9. (original) The computer-readable medium of claim 1 wherein the encoder adjusts the quantization step size also in view of a value of control parameter for the block, and wherein the encoder computes the value to correct bias in a model that relates quality and bitrate or bit count to quantization step size.

10. (currently amended) In [[an]] a spectral audio encoder, a computer-implemented method comprising:
performing a frequency transform on plural time domain audio samples to produce a block of frequency coefficients; and
compressing [[a]] the block of frequency coefficients, wherein the compressing includes,
quantizing the block of frequency coefficients;
comparing a quality measure for the block to a quality target; and
comparing a bit-count measure for the block to a minimum-bits target and to a maximum-bits target.

11. (original) The method of claim 10 wherein the compressing further includes:
computing the quality measure based upon the quantized block of frequency coefficients;
entropy encoding the quantized block of frequency coefficients; and

computing the bit-count measure based upon the entropy encoded block of frequency coefficients.

12. (original) The method of claim 10 wherein a first quantization loop includes the quantizing and the comparing the quality measure, and wherein a second quantization loop de-linked from the first quantization loop includes the comparing the bit-count measure.

13. (original) The method of claim 10 wherein the quality target, the minimum-bits target, and the maximum-bits target are for the block.

14. (currently amended) A computer-readable medium encoded with computer-executable instructions for causing a computer programmed thereby to perform a method of controlling quality and bitrate in an audio encoder, the method comprising:

determining one or more target quality parameters, a first target quality parameter of the one or more target quality parameters indicating an acceptable audio quality;

determining plural target bitrate parameters, a first target bitrate parameter of the plural target bitrate parameters indicating a minimum acceptable number of bits produced, and a second target bitrate parameter of the plural target bitrate parameters indicating a maximum acceptable number of bits produced; and

compressing audio information, wherein quantization of the audio information is based at least in part upon the first target quality parameter, the first target bitrate parameter, and the second target bitrate parameter.

15. (currently amended) The computer-readable medium of claim 14 wherein the method further comprises performing a frequency transform on plural time domain audio samples, producing a block of frequency coefficients, and wherein the audio information is [[a]] the block of frequency coefficients.

16. (original) The computer-readable medium of claim 15 wherein the first target quality parameter, the first target bitrate parameter, and the second target bitrate parameter are for the block.

17. (original) The computer-readable medium of claim 14 wherein the compressing includes:

quantizing the audio information;

computing a quality measure based upon the quantized audio information; and

comparing the quality measure to the first target quality parameter.

18. (original) The computer-readable medium of claim 14 wherein the compressing includes:

quantizing the audio information;

entropy encoding the quantized audio information;

computing a bit-count measure based upon the entropy encoded audio information; and

comparing the bit-count measure to the first and second target bitrate parameters.

19. (original) The computer-readable medium of claim 14 wherein the compressing includes:

in a first quantization loop, adjusting the quantization until satisfaction of the first target quality parameter; and

in a second quantization loop, adjusting the quantization until satisfaction of the first and second target bitrate parameters.

20. (original) The computer-readable medium of claim 14 wherein the first target bitrate parameter is a function of factors comprising an average bit count estimate, buffer fullness, and buffer sweet spot.

21. (original) The computer-readable medium of claim 14 wherein the second target bitrate parameter is a function of factors comprising an average bit count estimate, buffer fullness, and buffer sweet spot.

22. (original) The computer-readable medium of claim 14 wherein the first target quality parameter is a function of factors comprising a complexity estimate and goal bit count.

23. (original) The computer-readable medium of claim 22 wherein the complexity estimate is a composite of a past complexity estimate and a future complexity estimate.

24. (original) The computer-readable medium of claim 22 wherein the complexity estimate is based at least in part upon a complexity estimate reliability measure.

25. (currently amended) The computer-readable medium of claim 22 wherein the audio information is a block of frequency coefficients, and wherein the goal bit count is based at least in part upon size of the block and maximum block size.

26.-100. (canceled)